

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Applicant : Harold Beck Docket No.: 03-11  
Serial No.: 10/663,324 Examiner : Aughenbaugh, W.  
Filed : September 15, 2003  
For : **VINYL ESTER HOSE AND METHOD FOR MANUFACTURE OF SUCH HOSE**

---

Mail Stop - AF  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

AMENDMENT UNDER 37 CFR 1.116 AND REQUEST FOR WITHDRAWAL OF  
FINALITY OF OFFICIAL ACTION

This Paper is submitted in response to the Official Action mailed June 26, 2008.

No amendment have been made to the Specification.

Amendments to the claims are shown in the Listing of Claims that begin on page 2 of this paper.

A Remarks section begins on page 6 of this paper.

## Listing of the Claims

### 1-9 (Canceled)

10. (Currently Amended) A vulcanized, automotive fluid-conveying hose for conveying fluids in ~~an automotive engine cooler, a transmission oil cooler, a power transmission cooler, radiator or heater~~, said vulcanized, automotive fluid-conveying hose consisting of an inner tubular member, a reinforcement member on said inner tubular member, and a cover on said reinforcement member, wherein said inner tubular member consists of:

about 30 to 75% by weight of an ethylene-vinyl acetate copolymer, wherein said ethylene-vinyl acetate copolymer has a vinyl acetate content greater than about 40%;

up to about 50% by weight of a polymeric material selected from the group consisting of ethylene-propylene-diene terpolymer (EPDM), styrene-butadiene rubber (SBR), acrylonitrile-butadiene rubber (NBR), ethylene-propylene rubber (EPR), butyl rubber, cis-polybutadiene, cis-polyisoprene, polyurethane, and mixtures thereof; and

about 25 to 70% by weight of one or more additives selected from the group consisting of process aids, fillers, plasticizers, metal oxides, metal hydroxides, peroxides, coagents, antioxidants and combinations thereof.

### 11-22 (Canceled)

23 (Currently Amended) The hose of claim 10, wherein said ethylene-vinyl acetate copolymer has a vinyl acetate content of about 60 to 90%.

24. (Currently Amended) The hose of claim 10, wherein said hose inner tubular member consists of:

about 45 to 60% by weight of an ethylene-vinyl acetate copolymer; wherein said ethylene-vinyl acetate copolymer has a vinyl acetate content greater than about 40%;

up to about 10% by weight of a polymeric material selected from the group consisting of ethylene-propylene-diene terpolymer (EPDM), styrene-butadiene rubber (SBR), acrylonitrile-butadiene rubber (NBR), ethylene-propylene rubber (EPR), butyl

rubber, cis-polybutadiene, cis-polyisoprene, polyurethane, polyamide, and mixtures thereof; and

~~up to~~ about 40 to 55% by weight of one or more additives, said one or more additives consisting of:

(a) up to about 8% by weight process aid selected from the group consisting of stearic acid, stearates, polyethylene, amines, oils, organic esters, organic phosphate esters and combinations thereof;

(b) about 20 to 60% by weight filler selected from the group consisting of carbon black, silicon dioxide, fumed silica, precipitated silica, diatomaceous earth, magnesium carbonate, magnesium silicate, aluminum silicate, titanium dioxide, talc, mica, aluminum sulfate, calcium sulfate, graphite, wallastonite, molybdenum disulfide, clay, calcium carbonate and combinations thereof;

(c) up to about 15% by weight plasticizer selected from the group consisting of hydrocarbons, glycols, aldehydes, ethers, esters, ether-esters and combinations thereof;

(d) up to about 10% by weight metal oxides and/or hydroxides selected from the group consisting of zinc oxide, zinc hydroxide, magnesium oxide, magnesium hydroxide, calcium oxide, calcium hydroxide, aluminum hydroxide and combinations thereof;

(e) about 0.5 to 5% by weight peroxide selected from the group consisting of 2,5-dimethyl-2,5-di(t-butylperoxy)hexyne-3; 2,5-dimethyl-2,5-di(t-butylperoxy)hexane;  $\alpha,\alpha'$ -bis(t-butylperoxy)-p-diisopropylbenzene; dicumyl peroxide; di-t-butyl peroxide; 1,1-bis(t-butylperoxy)-3,3,3-trimethylcyclohexane; 2,4-dichlorobenzoyl peroxide; benzoyl peroxide; p-chlorobenzoyl peroxide; 4,4-bis(t-butylperoxy) valerate; and combinations thereof.

(f) up to about 5% by weight coagent selected from the group consisting of maleimides, triallyl cyanurate, triallyl isocyanurate, diallyl terephthalate, 1,2-vinyl polybutadiene, di- and tri-functional methacrylates, diacrylates, metal ion versions thereof and combinations thereof; and

(g) up to about 3% weight antioxidant selected from the group consisting of phenols, hydrocinnamates, hydroquinones, hydroquinolines, diphenylamines, mercaptobenzimidazoles, and combinations thereof.

25–26 (Canceled)

27. (Previously Amended) The hose of claim 10 wherein said inner tubular structure is a blend of said ethylene-vinyl acetate copolymer, said polymeric material and said additives.

28. (Previously Amended) The hose of claim 10 wherein said reinforcement member is cotton fiber, polyester fiber, rayon fiber, aramid fiber or metal wire.

29. (New) The hose of claim 24, wherein said ethylene-vinyl acetate copolymer has a vinyl acetate content of about 60 to 90%.

30. (New) The hose of claim 10, wherein said one or more additives consist of:

(a) up to about 8% by weight process aid selected from the group consisting of stearic acid, stearates, polyethylene, amines, oils, organic esters, organic phosphate esters and combinations thereof;

(b) about 20 to 60% by weight filler selected from the group consisting of carbon black, silicon dioxide, fumed silica, precipitated silica, diatomaceous earth, magnesium carbonate, magnesium silicate, aluminum silicate, titanium dioxide, talc, mica, aluminum sulfate, calcium sulfate, graphite, wallastonite, molybdenum disulfide, clay, calcium carbonate and combinations thereof;

(c) up to about 15% by weight plasticizer selected from the group consisting of hydrocarbons, glycols, aldehydes, ethers, esters, ether-esters and combinations thereof;

(d) up to about 10% by weight metal oxides and/or hydroxides selected from the group consisting of zinc oxide, zinc hydroxide, magnesium oxide, magnesium hydroxide, calcium oxide, calcium hydroxide, aluminum hydroxide and combinations thereof;

(e) about 0.5 to 5% by weight peroxide selected from the group consisting of 2,5-dimethyl-2,5-di(t-butylperoxy)hexyne-3; 2,5-dimethyl-2,5-di(t-butylperoxy)hexane;  $\alpha,\alpha'$ -bis-(t-butylperoxy)-p-diisopropylbenzene; dicumyl peroxide; di-t-butyl peroxide; 1,1-bis(t-butylperoxy)-3,3,3-trimethylcyclohexane; 2,4-dichlorobenzoyl peroxide; benzoyl peroxide; p-chlorobenzoyl peroxide; 4,4-bis(t-butylperoxy) valerate; and combinations

thereof.

(f) up to about 5% by weight coagent selected from the group consisting of maleimides, triallyl cyanurate, triallyl isocyanurate, diallyl terephthalate, 1,2-vinyl polybutadiene, di- and tri-functional methacrylates, diacrylates, metal ion versions thereof and combinations thereof; and

(g) up to about 3% weight antioxidant selected from the group consisting of phenols, hydrocinnamates, hydroquinones, hydroquinolines, diphenylamines, mercaptobenzimidazoles, and combinations thereof.

Remarks

This paper is submitted in response to the Official Action mailed June 26, 2008.

Review and reconsideration of this application is respectfully requested.

Claims 10, 23, 24 and 27-30 are in this application.

Claims 1, 2, 8, 21, 22 and 25 are canceled by this amendment.

Claims 3-7, 9, 11-20 and 26 were canceled by a previous amendment.

New claims 29 and 30 have been added by this amendment.

Claim 10 has been amended at line 3 to delete “engine cooler” at line 2, and to delete “a power transmission cooler, radiator or heater”.

Claim 23 has been amended at line 1 to add “ethylene-“ in “ethylene-vinyl acetate” to correct an inadvertent error of omission.

Claim 24 has been amended at line 1 to replace the term “hose” with “inner tubular member”, and at line 10 to delete “up to”.

The above amendments are minor, do not include any new matter, and do not affect the scope of the claims; nor would such amendments cause any additional consideration on the part of the Office.

The Examiner states that applicant’s previous amendment necessitated the new ground(s) of rejection. Applicant respectfully disagrees for the following reasons.

In regard to the rejection of claims 1, 8 and 25 Under 35 USC 102(b) as being

anticipated by Hasegawa et al. (6,755,995), the only amendment made in the previous amendment was to delete the term “matrix” from claim 1 and 8 and; therefore did not necessitate a new ground(s) of rejection of claims 1, 8 and 25 over that the Hasegawa et al. reference. Applicant submits that such reference could have been cited in a previous Office Action for the same reasons as set forth in the rejection of claim 1, 8 and 25 in the present Office Action.

In regard to the rejection of claim 2 Under 35 USC 103(a) as being unpatentable over Hasegawa et al. (6,755,995), no amendments were made in the previous amendment with respect to claim 2; therefore, claim 2 did not necessitate a new ground(s) of rejection. Applicant submits that claim 2 could have been rejected over Hasegawa et al. in a previous Office Action for the same reasons as set forth in the rejection of claim 2 in the present Office Action.

With respect to the rejection of claims 10, 21-24, 27 and 28 as being unpatentable over Hoh et al. (3,941,904) in view of Hasegawa et al., the only amendments made in the previous amendment was to delete the terms “matrix” and “essentially” from claim 10 and to remove the term “matrix” from claim 24 and; therefore, did not necessitate a new ground(s) of rejection of claims 10, 21-24, 27 and 28. Applicant contends that the rejection of claims 10, 21-24, 27 and 28 over Hoh et al. in view of Hasegawa et al. could have been cited in a previous Office Action for the same reasons as set forth in the rejection of claim 10, 21-24, 27 and 28 in the present Office Action.

Accordingly, for the above reasons, applicant respectfully requests that the Examiner withdraw the finality of the Office Action mailed June 26, 2008 and consider the present Amendment as an Amendment and Response to a Non-Final Rejection.

Applicant acknowledges and appreciates the examiner’s withdrawal of all objections made of record in the previous Office Action mailed October 5, 2006 due to applicant’s arguments in the response submitted April 13, 2007 and Applicant’s amendments in the Amendment filed March 24, 2008.

Applicant acknowledges and appreciates the examiner's withdrawal of the rejections of claims 1, 8, 10 and 14 made of record in the previous Office Action mailed October 5, 2006 due to applicant's arguments in the response submitted April 13, 2007 and Applicant's amendments in the Amendment filed March 24, 2008.

Applicant acknowledges and appreciates the examiner's withdrawal of the rejections of claims 26 and 27 made of record in the previous Office Action mailed October 5, 2006 due to applicant's arguments in the response submitted April 13, 2007 and Applicant's amendments in the Amendment filed March 24, 2008.

Applicant acknowledges and appreciates the examiner's withdrawal of the rejections of claims 1, 2, 8, 10 and 21-27 as being anticipated by Igarashi et al. (USPN 5,223,571) made of record in the previous Office Action mailed October 5, 2006 due to applicant's deletion of "essentially" in "consisting essentially of" in independent claims 1 and 10 in the Amendment filed March 24, 2008.

## **NEW REJECTIONS**

### ***Claim Rejections – 35 USC § 102***

9. Claims 1, 8 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Hasegawa et al. ('995).

In regard to claim 1, the Examiner alleges that Hasegawa et al. teach the tubular structure as claimed, where the tubular structure (embodiments that consist of one layer are taught at col. 7, lines 17-32, particularly lines 25-27 and 29) consists of an ethylene vinyl acetate copolymer (EVA), and ethylene propylene rubber (EPR) and a hydrated inorganic compound (col. 2, lines 55-67 and lines 48-49 and col. 3, lines 29-40). The relative amounts of EVA and EPR of 80:20 to 40:60 overlaps with the claimed amounts for the EVA and EPR (col. 2, lines 64-67), and the amount of the hydrated inorganic compound of 5 to 50 PBW (col. 3, lines 29-32) falls within the claimed amount for the

one or more additives.

In regard to claim 8, Hasegawa et al. teach the tube as discussed above in regard to claim 1. Furthermore, Hasegawa et al. teach that magnesium hydroxide is a suitable material for the hydrated inorganic compound (col. 3, lines 53-55), and the amount of the hydrated inorganic compound of 5 to 50 pbw taught by Hasegawa et al. (col. 3, lines 29-32) overlaps with the claimed amount for the additives listed under section (d) of claim 8.

In regard to claim 25, Hasegawa et al. teach a blend of the EVA, EPR and hydrated inorganic compound (col. 2, lines 55-67 and lines 48-49 and col. 3, lines 29-40).

### ***Claim Rejections 35 USC § 103***

10. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al.

The Examiner alleges that Hasegawa et al. teach the tubular structure as discussed above. Hasegawa et al. fail to teach that the vinyl acetate content of the ethylene vinyl acetate copolymer is about 60 to 90%. Hasegawa et al., however, teach that the flame retardancy of the ethylene vinyl acetate copolymer is comparatively high (relative to that of polyethylene homopolymer) (col. 2, lines 55-58). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have increased the amount of the vinyl acetate in the ethylene vinyl acetate copolymer relative to that of the ethylene repeating unit in order to achieve the desired degree of flame retardancy, depending on the particular desired end result, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art in the absence of unexpected results. The Examiner cites: *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). MPEP 2144.05 II.B.

11. Claims 10, 21-24, 27 and 28 are rejected under 35 U.S.C 103(a) as being unpatentable over Hoh et al. ‘941 in view of Hasegawa et al. ‘995.

In regard to claim 10, the Examiner alleges that Hoh et al. teach a reinforced hose comprising a reinforcement layer sandwiched between a polymeric inner tube and an outer cover layer (col. 13, line 65-col. 14 Line 11). The Examiner admits that Hoh et al. fail to teach that the polymeric inner tube consists of the components recited in claim 10. Hasegawa et al., however, disclose a tube which is pliable (col. 7, lines 34-36) that either consists of (embodiments that consist of one layer are taught at col. 7, lines 25-32, particularly lines 25-27 and 29) or comprises a layer that consists of (multilayer embodiments are taught at col. 7, lines 17-25 and lines 39-43) an ethylene vinyl acetate copolymer (EVA), an ethylene-propylene rubber (EPR) and a hydrated inorganic compound (col. , lines 55-67 and lines 48-49 and col. 3, lines 29-40). The relative amounts of EVA and EPR of 80:20 to 40:60 overlaps with the claimed amounts for the EVA and EPR (col. 2, lines 64-67), and the amount of the hydrated inorganicl compound of 5 to 50 PBW (col. 3, lines 29-32) falls within the claimed amount for the one or more additives. Since Hasegawa et al. teach that the tube is pliable (col. 7, lines 34-36), it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the composition taught by Hasegawa et al. as the material of the polymeric inner tube of the tube of Hoh et al. since a blend of ethylene vinyl acetate copolymer (EVA), an ethylene-propylene rubber (EPR) and a hydrated inorganic compound is a well known suitable material for use as the material of a flexible tube as taught by Hasegawa et al.

In regard to claims 21 and 22, the Examiner alleges that Hoh et al. and Hasegawa et al. teach the hose as discussed above. The recitations “is a radiator hose” and “is a heater hose” are intended use recitations that have been given little patentable weight, since it has been held that a recitation with respect to the manner in which a claimed article is intended to be employed does not differentiate the claimed article form a prior art article satisfying the claimed structural limitations. The Examiner cites: *Ex parte Mashkam*, 2 USPQd 1647 (1987).

In regard to claim 23, the Examiner alleges that Hoh et al. and Hasegawa et al.

teach the tube as discussed above in regard to claim 10. The Examiner admits that Hoh et al. and Hasegawa et al. fail to teach that the vinyl acetate content of the ethylene vinyl acetate copolymer is about 60 to 90%. Hasegawa et al., however, teach that the flame retardancy of the ethylene vinyl acetate colpolymer is comparatively high (relative to that of polyethylene homopolymer) (col. 2, lines 55-58. Therefore, the Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have increased the amount of the vinyl acetate in the ethylene vinyl acetate copolymer relative to that of the ethylene repeating unit in order to achieve the desired degree of flame retardancy, depending on the particular desired end result, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art in the absence of unexpected results. The Examiner cites: *I re Boesch*, 617 Fd 272, 205 USPQ 215 (CCPA 1980), MPEP 2144.05 II.B.

In regard to claim 24, the Examiner alleges that Hoh et al. and Hasegawa et al. teach the tube as discussed above in regard to claim 10. Furthermore, the Examiner alleges that Hasegawa et al. teach that magnesium hydroxide is a suitable material for the hydrated inorganic compound (col. 3, lines 52-55), and the amount of the hydrated inorganic compound of 5 to 50 pbw taught by Hasegawa et al. (col. 3, lines 29-32) overlaps with the claimed amount for the additives listed under section (d) of claim k8, so the hose taught by Hoh et al. and Hasegawa et al. as discussed above in regard to claim 24 comprises magnesium hydroxide in an amount of 5 to 50 pbw (col. 3, lines 29-32), a range that overlaps with the claimed amount for the additives listed under section (d) of claim 24.

In regard to claim 27, the Examiner alleges that Hasegawa et al. teach the tube as discussed above in regard to claim 10. Furthermore, the alleges that Hasegawa et al. teach a blend of the EVA, EPR and hydrated inorganic compound (col. 2, lines 55-67 and lines 48-49 and col. 3, lines 29-40).

In regard to claim 28, the Examiner alleges that Hoh et al. teach that the reinforcement member comprises cotton, synthetic yarn or wire (col. 14, lines 1-3), so the

hose taught by Hoh et al. and Hasegawa et al. comprises a reinforcement member that comprises cotton, synthetic yarn or wire.

## **APPLICANT'S AMENDMENTS AND RESPONSE TO NEW CLAIM REJECTIONS**

9a In response to the Examiner's rejection of claims 1, 8 and 25 under 35 U.S.C. 102(b) as being anticipated by Hasegawa et al., applicant has canceled claims 1, 8 and 25. Accordingly, this rejection can now be withdrawn.

10a. In response to the Examiner's rejection of claim 2 under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al., applicant has canceled claim 2. Accordingly, this rejection can now be withdrawn.

11a. Claims 10, 21-24, 27 and 28, are rejected under 35 U.S.C 103(a) as being unpatentable over Hoh et al. '941 in view of Hasegawa et al. '995.

With respect to the rejection of claim 10, applicant respectfully disagrees with the Examiner that since, Hasegawa et al. teach that the tube is pliable, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the composition taught by Hasegawa et al. as the material of the polymeric inner tube of the tube of Hoh et al. since a blend of ethylene vinyl acetate copolymer (EVA), an ethylene-propylene rubber (EPR) and a hydrated inorganic compound is a well known suitable material for use as the material of a flexible tube as taught by Hasegawa et al.

Applicant contends that the Examiner has combined two references that are from two different fields of search, and such references are concerned with two entirely different subject matters. The primary reference to Hoh et al describes a method of applying adhesive coatings such as a hot melt adhesive to a substrate. Such compositions are particularly useful in the manufacture of reinforced flexible hoses. Hoh et al make a very brief disclosure to the fact that hoses (the very brief disclosure does not specify

flexible hoses) are conventionally prepared by placing a reinforcement layer over a suitable polymeric inner layer and an outer cover is generally applied over the reinforcement layer. The secondary reference to Hasegawa et al. teaches a halogen-free flame-retardant composition that is used as a coating or covering for electrical wires, cables and the like. In such applications the wire itself is a conductive solid core that serves as a conductive path for conveying electric current and the outer cover is a flame-retardant insulating material. In such structure, the outer cover is the EVA-EPR flame-retardant material covering the solid wire core and there is no inner polymeric tubular member. Furthermore, there is no teaching in Hasegawa et al. of a tubular member having an EVA-EPR-inorganic material member as an inner tubular member in a multilayer structure. Therefore, applicant submits that it would not be obvious from the teachings of Hasegawa et al. and Hoh et al., to use the composition of Hasegawa et al. as the material of the polymeric inner tube of the tube of Hoh et al. Hasegawa et al. teaches that the EVA-EPR-inorganic material is used as a covering or sheath, i.e., an outer layer. Hasegawa does not contemplate a polymeric inner layer at all. Therefore, a combination of the references as suggested by the Examiner would not provide a tubular structure in which the EVA-EPR-inorganic material is the inner layer. Any incentive derived from the combination of the Hasegawa et al. and Hoh et al. references would be to use the composition of Hasegawa et al. as the outer layer of Hoh et al. Therefore, applicant submits that claim 1 is not obvious over the reference to Hoh et al. in view of Hasegawa et al. Accordingly, it is believed that that this rejection should now be withdrawn.

With respect to the rejection of claims 21 and 22, these claims have now been canceled. Accordingly, this rejection can now be withdrawn.

With respect to the rejection of claim 23, applicant submits that the Examiner's argument is without merit. The specific citation (Col, 2, lines 55-58) offered by the Examiner to substantiate that increased vinyl acetate improves flame-retardance simply indicates that the mentioned resins, including polyethylene, ethylene-vinyl acetate (EVA) and ethylene-ethyl acrylate (EEA), may be used alone or in combination. The EVA and EEA are particularly preferred because the flame retardancy of the resin itself is

comparatively high. Applicant can find no support for the Examiner's allegation that it is the VA content of the EVA resin that provides increased flame retardancy, since both EVA and EEA are equally preferred and EEA contains no vinyl acetate. A closer review of Hasegawa et al. reveals that it is the inorganic compound that provides the flame retardancy to the resin composition and not the VA content of the EVA as suggested by the Examiner (Abstract; Col. 2, lines 11-14; and lines 25-26; Col. 3, lines 9-12 and lines 34-35, for example)

Furthermore, Hasegawa et al. require that the outer layer is the flame-retardant EVA-EPR polymeric material containing the hydrated inorganic compound over a wire core in electrical wires and cables. Hasegawa et al. appears to briefly disclose as a catch-all, that the halogen-free flame-retardant resin composition of their invention may be used as agricultural sheet, water hoses, gas tube coating materials, building interior materials, furnishing materials, toy materials and floor materials. These speculated uses of the flame-retardant EVA-EPR polymeric material containing hydrated inorganic compound fail to teach the composition as an inner tubular structure for an automotive hose. Indeed, any flame-retardant structure would be expected to have a flame-retardant material as an outer cover of the structure, not as an inner material as required in the present invention..

With respect to the rejection of claim 24, claim 24 is a dependent claim depending from independent claim 10 and, since claim 10 is now believed to be allowable, claim 24 is also believed to be allowable.

With respect to the rejection of claim 27, claim 27 is a dependent claim depending from independent claim 10 and, since claim 10 is now believed to be allowable, claim 27 is also believed to be allowable.

With respect to claim 28, claim 28 is a dependent claim depending from independent claim 10 and, since claim 10 is now believed to be allowable, claim 28 is also believed to be allowable.

New claim 29 is an independent claim similar to dependent claim 10 but containing the further limitations of claim 24.

In view of the above amendments and remarks, it is believed that the present application is now in condition for allowance and an early indication thereof is earnestly solicited.

In the event that the Examiner find the amendments and/or remarks unconvincing, applicant respectfully requests that the Examiner withdraw the finality of the Office Action mailed June 26, 2008 for the reasons set forth in the above remarks.

Respectfully Submitted,

/J. Daniel Lykins/  
J. Daniel Lykins  
Reg. No. 27,354

Dayco Products, LLC  
1 Prestige Place  
Miamisburg, Ohio 45342  
Telephone No.: (937) 226-5725